

Operating Instructions for Pressure Sensor with Ceramic Sensor Element

Model: SEN-9601



We don't accept warranty and liability claims neither upon this publication nor in case of improper treatment of the described products.

The document may contain technical inaccuracies and typographical errors. The content will be revised on a regular basis. These changes will be implemented in later versions. The described products can be improved and changed at any time without prior notice.

© **Copyright**

All rights reserved.

1. Contents

1. Contents.....	2
2. Note	3
3. Instrument Inspection.....	3
4. Regulation Use	3
5. General	4
6. Installation	4
7. Electrical Connection	5
8. Maintenance	6
9. Product Label.....	6
10. Technical Information.....	6
11. Order Codes	8
12. Dimensions	9
13. Declaration of Conformance	10

Manufactured and sold by:

Kobold Messring GmbH
Nordring 22-24
D-65719 Hofheim
Tel.: +49(0)6192-2990
Fax: +49(0)6192-23398
E-Mail: info.de@kobold.com
Internet: www.kobold.com

2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EWG-machine guidelines.

3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition.

Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:

The standard delivery includes:

- Pressure Sensor with Ceramic Instrument model: SEN-9601
- Operating Instructions

4. Regulation Use

Any use of the Pressure Sensor with Ceramic Sensor Element, model: SEN-9601, which exceeds the manufacturer's specification may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.



Caution!

The manufacturer disclaims all responsibility in case of damages caused by the improper use of the product and by the non-respect of the instructions reported in this manual.

- Follow carefully the specific safety rules in case of measuring oxygen pressure, acetylene, inflammable or toxic gas or liquids.
- Disconnect the instruments only after depressurization of the system.
- The process fluids residuals in the disassembled instruments could affect people, the environment and the system. It is highly recommended to take proper precautions.



Before installation be sure that the right instrument has been selected following the working conditions and in particular the range, the working temperature and the compatibility between the material used and the process fluid.

- This manual does not concern the instruments conforming to standard 94/9/CE (ATEX).
- The product warranty is no longer valid in case of non-authorized modifications and of wrong use of the product.
- The user is totally responsible for the instrument installation and maintenance.
- Handle and carefully stock the instrument used for toxic or inflammable liquids measurement

The pressure transmitter turns the input pressure into an output electrical signal. The electrical signal changes in proportion to the input pressure level.

5. General

The KOBOLD SEN-96 Standard model is an electronic transmitter with ceramic sensor for air, industrial, technical gases and water and oil, designed to be installed in gas distribution plants, on bottles, on refrigerators, on compressors, on vacuum pumps and hydraulics and water high pressure plants. It is ideally suited to be used in the industry in general, in the gas stocking or machines production, in light or heavy pneumatics industry, in the refrigeration industry, in welding and vacuum.

6. Installation

Before installing electrical instrument safely and securely into a plant or a system the user should verify the instrument suitability to the plant characteristics and the correct installation. After installation the user should verify that the instrument is not exposed to any source of heat exceeding the established ambient limits.

Secure the instrument thread through a special key/wrench on the process connection hexagon (20...30 Nm). The correct torque depends on the type of process connection and the type of seal used (form and material).

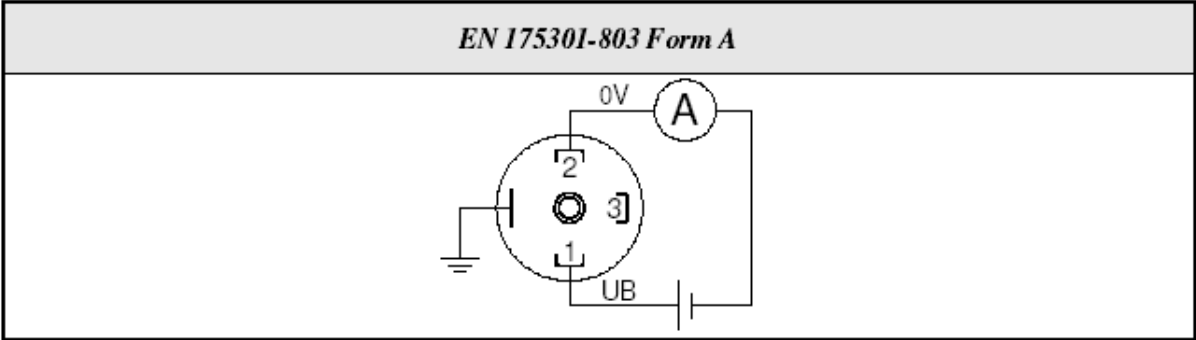
As for those process connections with a cylindrical thread (Gas-Metric), a head gasket compatible with the measurement gas or fluid should be used.

If the connection thread is conical the instrument is tightened through a simple screwing on the plug. In order to improve the thread tightness it is recommended to place a PTFE layer on the male thread.

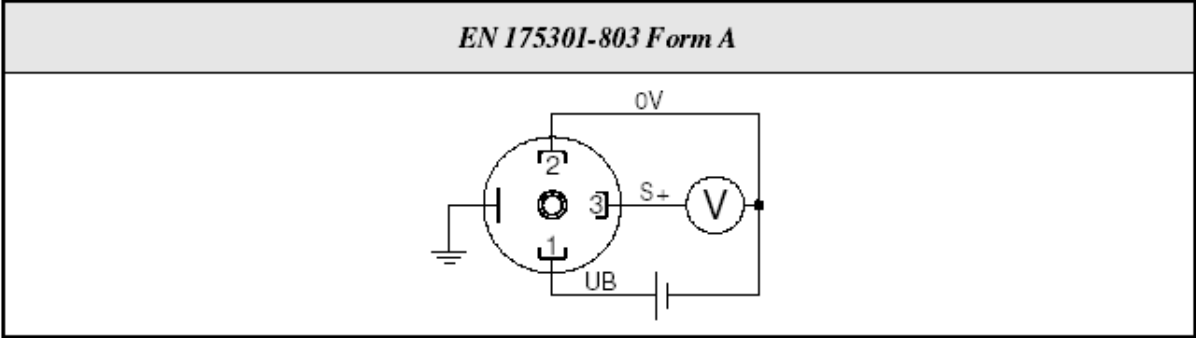
If the instrument is equipped with a fluid diaphragm seal the connection should be clamped on the diaphragm otherwise the calibration could be compromised.

7. Electrical Connection

Output signal:	4...20 mA
N° of wires:	2
Charge (Ohm):	$R_L - (UB-9)/0,02$
Input UB:	8...30



Output signal:	0...5 Vdc	0...10 Vdc	0,5...4,5 Vdc
N° of wires:	3	3	3
Charge (Ohm):	min. 5Kohm	min. 10Kohm	min. 5Kohm
Input +Vin:	8...30	14...30	5



The transmitter metal case should always be connected to ground through the process connection thread in order to protect it from disturbances due to electromagnetic fields or electrostatic charges.
If it is not possible to do so, connect the transmitter to ground through the connector and the cable screen.

8. Maintenance

The SEN-9601 transmitter is “*maintenance free*”.

If a fault occurs, contact Kobold.

Using transmitters that have been subjected to work not explicitly authorised by Kobold relieves the Company of any and all responsibility and causes the contractual guarantee to become null and void.

9. Product Label



10. Technical Information

Ranges:	0 ... 1/0 ... 600 bar, relative, -1... 0/-1... +24 bar, relative
Accuracy:	$\leq \pm 1.0\%$ of the range*
Non-linearity (BFSL):	$\leq \pm 0.5\%$ of the range, according to EN 61298-2
Non-repeatability:	$\leq 0.1\%$ of the range, according to EN 61298-2
Output signal deviation of zero:	$\leq \pm 0.5\%$ of span, typical; $\pm 0.8\%$ of span, max.
Thermal drift:	Between 0 and 80 °C, 1 % of span; 2.5 % of span, max.
Long term drift:	$\leq 0.2\%$ of span, according to EN 61298-2
Process fluid temperature, ambient and stocking temperature:	-25 ... +85 °C
Output signals:	4... 20 mA, 0...5 VDC, 0...10 VDC, 1... 5 VDC, 0.5... 4.5 ratiometric VDC
Response time:	<4 ms
Emission and immunity:	According to EN 61326, (group 1 - class B; industrial applications)
Process connection:	In AISI 316L, hole \varnothing 2.5 mm
Sensor:	Ceramic in Al ₂ O ₃
Case:	In AISI 316L, vented up to 16 bar

Gasket (Sensor): FKM
Electric connection: EN 175301-803 Form A
Protection degree: IP 65 according to IEC 529 / EN 60529**
Weight: 0.12 kg

* Including non-linearity, hysteresis, non-repeatability and output signal deviation of zero at the reference conditions described in standard

EN 61298-1

** with properly assembled electric connection .

Ranges Bar, relative	Overpressure Bar, relative
-1...0	5
-1...0.6	5
-1...1.5	5
-1...3	8
-1...5	12
-1...9	20
-1...15	32
-1...24	50
0...1/0...1.6/0...2.5	5
0...4	8
0...6	12
0...10	20
0...16	32
0...25	50
0...40	80
0...60	120
0...100	200
0...160	320
0...250	500
0...400	600
0...600	800

11. Order Codes

Order Details (Example: **SEN-9601 0 B075 A 0**)

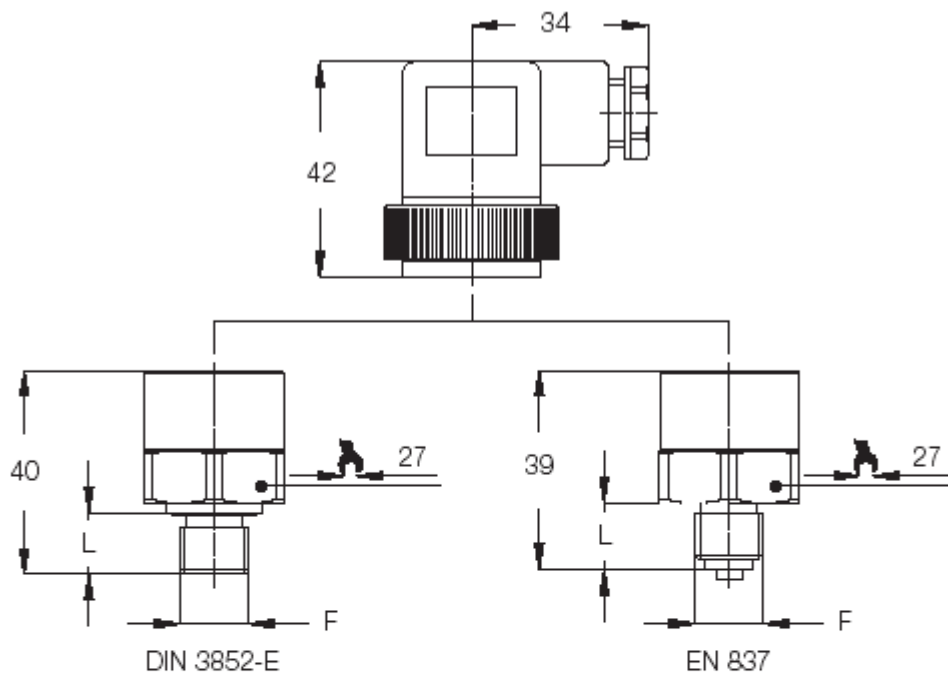
Model	Output	Measuring range	Mechanical Connection	Options
SEN-9601...	...0... = 4-20 mA, 2-wire (standard) ...1*... = 0...5 V_{DC} (8...30 V_{DC}) ...2*... = 0...10 VDC (14...30 VDC) ...3*... = 0.5...4.5 VDC ratiometric (5 VDC ± 10 %) ...4*... = 1...5 VDC (8...30 VDC)	C 315 = -1...0 bar	A = G $\frac{1}{2}$, male (standard) B* = G $\frac{1}{4}$, male E* = G $\frac{1}{4}$ DIN 3852-E, male F* = $\frac{1}{2}$ "NPT, male G* = $\frac{1}{4}$ "NPT, male	0 = without Y* = special option (specify in clear text)
		C 505* = -1...0.6 bar		
		C 515* = -1...1.5 bar		
		C 525* = -1...3 bar		
		C 535* = -1...5 bar		
		C 545* = -1...9 bar		
		C 555* = -1...15 bar		
		C 565* = -1...24 bar		
		B 025 = 0...1 bar		
		B 035 = 0...1.6 bar		
		B 045 = 0...2.5 bar		
		B 055 = 0...4 bar		
		B 065 = 0...6 bar		
		B 075 = 0...10 bar		
		B 085 = 0...16 bar		
		B 095 = 0...25 bar		
		B 105 = 0...40 bar		
		B 115 = 0...60 bar		
		B 125 = 0...100 bar		
		B 135 = 0...160 bar		
		B 145 = 0...250 bar		
		B 155 = 0...400 bar		
		A 165* = 0...600 bar		

* Minimum or quantity = 20 pieces per item (identical model code)

Output signal code	4...20 mA 0	0...5 V _{DC} 1	0...10 V _{DC} 2	0.5...4.5 V _{DC} ratiometric – 3	1...5 V _{DC} 4
No. of wires	2	3	3	3	3
Load max. (Ω)	$R_L \leq (V_{in} - 8)/0.02$	$R_L \geq 5 \text{ K}\Omega$	$R_L \geq 10 \text{ K}\Omega$	$R_L \geq 4.5 \text{ K}\Omega$	$R_L \geq 5 \text{ K}\Omega$
Supply: + V _{in} (V _{DC})	8...30	8...30	14...30	5 ± 10 %	8...30
Absorbed current (mA)	< 25	< 10	< 10	< 10	< 10

All output signals are provided of protection against short circuit and polarity inversion.
Insulation tension 500 V_{DC}

12. Dimensions



F ¹⁾	L (mm)
A - G 1/2, male EN 837	20
B - G 1/4, male EN 837	13
E - G 1/4, male DIN 3852-E ²⁾	13
F - 1/2 - 14 NPT	20
G - 1/4 - 18 NPT	13

¹⁾ Torque 20...30 Nm

²⁾ For pressures up to 400 bar

13. Declaration of Conformance

We, KOBOLD Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the product:

Pressure Sensor with Ceramic Sensor Elements Model: SEN-9601

to which this declaration relates is in conformity with the standards noted below:

DIN EN 61326 -1 2006

Electrical equipment for measurement, control and laboratory use. EMC requirements-Industrial environment.

Also the following EWG guidelines are fulfilled:

2004/108/CE EMC - Electromagnetic compatibility

2011/65/EC Restriction of Hazardous Substances (RoHS)

97/23/EC PED

max. 200 bar

Category I

Module D1 / D

Notified body: Germanischer Lloyd Germany


Certificate number: 88 162 – 11 HH

Mark CE 0098

Hofheim, 28. May 2013



H. Peters
General Manager



M. Wenzel
Proxy Holder